

ART. X.—*Observations on the Isthmus of Panama, and on the Hospitals of Havana.* By G. R. B. HORNER, M. D., Surgeon U. S. Naval Hospital, Warrington, Florida. (Communicated by W. WHELAN, M. D., Chief Bureau Med. and Surg. U. S. N.)

THE discovery of gold in California, ten years since, has vastly increased the transit of persons, merchandise, &c., across the Isthmus—greatly augmented the importance of this strip of land, and, indeed, rendered it the great highway of nations. The most important portion at this time is the western, or most northerly of the Republic of New Grenada, which forms nearly a semicircle. This is bounded on the east by the Caribbean Sea, west by the Pacific, and north by Nicaragua and Costa Rica. The narrowest part of the Isthmus lies between Panama and Chagres, a small town at the mouth of the river of that name, and about forty miles from the former town; but the latter having a small, insecure harbour, Aspinwall has been built on the island of Manzanilla, in Navy Bay, some miles south of Chagres, and a substantial, well-graded railroad is constructed between the two places. But this was accomplished at the expense of more than a thousand lives, chiefly those of Chinese labourers. Miasmatic fevers were the principal causes of the mortality. Many, however, died of neglect and bad treatment. When a Chinaman got sick, it is said, it was common to lay him down in the woods, with some food and water by his side, and let him lie there until dead, or well enough to get away. Other patients were sent down to the hospital of the railroad company at Aspinwall, from whence every two weeks about two hundred were sent to New York, so that the precise mortality among them was not ascertained.

The railroad runs through several extensive morasses—densely overgrown with palms, wild cananias, bushes, vines, and large timber—strikes the Chagres River where the Gatun empties into it, runs up the right bank of the former, crosses it at Barbacoas by an iron bridge, passes up to Gorgona twenty-eight miles from Aspinwall, thence through a valley, bounded by several thickly wooded, very verdant mountains, and attains the summit level, which is only 487 feet above the level of the sea. From there the road gradually descends to Panama, through the valley of the little stream termed Rio Grande, perhaps in ridicule. Last year a party of men and officers from our squadron, headed by Com. Paulding and Col. Totten, chief engineer of the road, crossed the Isthmus by the railroad, closely inspected the route and bay of Panama, and reported the feasibility of a ship-canal along the same route. The colonel estimates the cost at \$70,000,000 for one 300 feet wide and 30 feet deep, with several locks in its course, and a breakwater at Aspinwall. The greatest obstacles to be encountered are the scarcity of native labourers, and the diseases incidental to foreigners, especially of the white race.

The bay of Panama and its numerous islands might afford anchorage for all the ships of the world which could be brought there; and the bay of Aspinwall could accommodate as many as would probably ever be collected in it, being two miles wide and three long; but being exposed to the north during the winter, when the wind blows strongly from the sea, it would require at least one very long breakwater, projecting into it from the eastern side of the entrance. All the Isthmus traversed by the railroad, and visible

from any part of it, is hilly and mountainous, has a diversity of soil, abounds in several varieties of basaltic rocks and volcanic remains, and is very fertile naturally. Its vegetable productions are numerous—and among them are yams, maize, cassava or tapioca, coffee, cananas, plantains, palm-nuts of various sorts, including the cocoa and cabbage, which affords much oil. The mango, lime, orange, small cheremaya, a large yellow species of annona, weighing sometimes three or four pounds, and belonging to the same class of plants as the former; the sour sop, abacata or calligator pear, and the pawpaw as large as a musklin, are likewise produced; but the orange, from neglect in cultivation, is very rare. Indeed, so poor is agriculture throughout the country, that much more of all its products is due to nature than to its inhabitants.

Papyrus abounds in the swamps; some species of cinchona are said to grow in the forests, and the cedron-bean (used as an antidote for poisoned wounds) on a small tree below Panama. Many species of cactus and of parasitical plants are found; and the latter are seen covering the monarchs of the forest, feeding upon their juices, until the stoutest trees die and crumble to dust. In time the parasites decay; those which had formed the longest vines, sweeping from the highest branches down to the ground, fall to pieces, nourish it, and help the growth of the young trees springing up in place of those destroyed. Near the sea-shore the mangrove, as if on stilts, elevates itself upon its limb-like roots, and spreads its branches high above the water, preventing all access ashore to every kind of vessels.

Both along the shores of Panama and Aspinwall, coral is abundant. Many reefs are formed of it, some are old and dry, others new and fresh; and the former, when crumbled, mixed with decomposed shells and sand, forms a very productive soil for some vegetables. Some of the finest land is upon the sides of the Chagres River, which arises in the eastern part of the Isthmus, winds along to the westward, then to the northward, just before it reaches the railroad and Gorgona; is navigable from Cruces, seven miles above, and averages about seventy feet in width, as far as Gatón. From thence it increases in size, until it reaches the town of Chagres. The banks of the river are bold, overhung with shrubs, vines, and trees, and produce the sugar-cane luxuriantly.

The island of Manzanilla is on the eastern side of Navy Bay, about two miles around; it is formed chiefly of sand and coral, and in no part exceeds eight feet above high tide. Near its centre is a swamp flooded with water, and a large pond is left near the middle of the town, which was formerly a cove; but has been converted into its present shape by being filled with earth next the harbour. This pond is nearly encircled by houses, receives the overflowing water from the swamp, and communicates with the harbour, beneath the railroad; but is a mere receptacle of filth, and mostly stagnant. The people of Aspinwall are, therefore, at all seasons infested with miasmatic fevers.

The islands in Panama Bay are numerous; some are large, all are rocky, high, and picturesque, and mostly composed of sandstone, extensively used in building. Tobago is the principal island, and is several leagues around; it contains some hundred people, produces the pine-apple, some cocoa, tamarinds, cocoa-nuts, and other fruits; and has the iron-works of the English Steam-Packet Company on a promontory, projecting towards Panama. The population of this is about 6,000, that of Aspinwall about 1,500, and both are principally inhabited by negroes, mestizos, and mulattoes. The

greater part of the former in Aspinwall are manumitted slaves from Jamaica, who subsist by working for the railroad company, and by peddling and shop-keeping. They drink to excess, and are devoted to music and dancing.

The animal kingdom of the Isthmus is nearly as rich as the vegetable. The waters teem with fish; insects, reptiles, birds, and quadrupeds abound on shore. With hooks and seines are caught the red rockfish, the cavallo, a large species of mackerel, the croaker, gar, perch, and parrot-fish. The last takes its name from its being as varied in colour as that bird, and tinged richly with green and blue. Mulletts, porpoises, the large green turtle, crabs, and sharks likewise abound. The turtle affords a very large part of the meat used at Aspinwall; the cattle killed there, from being driven far and illy fed, are poor and insipid. A few sheep, some hogs, goats, fowls, turkeys, and ducks serve also for sustenance to the richer classes; but the poor live chiefly on yams, plantains, bananas, and other vegetable food.

Among the wild animals of the Isthmus are the tiger, wild cat, mamoss or ant-bear, the deer, several species of monkeys, the alligator, and zææ, a large species of hedge-hog, of a brown colour, and having dark stripes on his back. Alligators abound in the Chagres River and other watercourses, on the banks of which they eat fish, and dogs, and within a few years have killed several persons.

Climate.—This is always sultry, never really cool or dry. The thermometer averages from 80° to 85° during the day, when the wind is blowing towards the land; but when off of it, as it generally does after 8 o'clock at night, it falls frequently to 76°, sometimes to 74°: and then from the free perspiration and sensibility of the skin, imparts such a sensation of coldness as to make woollen clothes pleasant. At Panama the heat is sometimes above 90°, and is more oppressive than at Aspinwall, where, in spring, summer, and fall, the wind mostly blows from the sea during the day, and from the land at night. During the winter it blows commonly from the northeast in the day, and causes a heavy swell in the bay. In the summer season it blows occasionally in squalls from that quarter, and is so stormy as to endanger ships at anchor there. After a tempest in winter, some years ago, so heavy a swell occurred, that three or four vessels were wrecked on the eastern shore of Manzanilla. One broke through the high, strong wharf of piles and planks, owned by the United States Steam-Mail Company. Another vessel was driven upon a reef opposite the wharf, broken to pieces, and wrecked on the adjacent shore, where she still lies. The range of the barometer is small. It rarely rises above 30½ of an inch, and very seldom falls below 30 inches, so that it is not considered at Aspinwall or vicinity a good indicator of the weather. Rain falls there in showers, ordinarily during the afternoon and at night, for nine months, at intervals; but rarely from the first of December to March. During last fall we had rain, more or less, and usually after meridian, for six days out of seven. During that period the atmosphere was saturated with moisture; clothes, books, and sails were spoiled with mould; small mushrooms sprang up in quantities on the tarred ropes coiled on deck, and especially on those not exposed to the sun. The rusting of all metallic substances liable to oxidation occurs correspondingly to the moisture of the atmosphere, rendered still more corrosive by the evaporation of sea-water, charged with chlorine and saline particles.

Diseases.—The most prevalent diseases among the inhabitants may be said to be those of the bowels and miasmatic fevers; but from these they

are exempt in comparison with strangers from North America and Europe. All of these, who are white, are certain in a short time to be affected with some form of those fevers, remittent or intermittent, of the quotidian or tertian type. These also, I was informed by Dr. Moore, of Aspinwall, preceded the yellow fever there, as has been observed in other countries; although it is stated by Dr. Hammond, U. S. Army,¹ to have followed the epidemic yellow fever, at Warrington, Florida, in 1853, when it was introduced by some recruits at the navy yard, and infected the inmates of the hospital. But the crew of the *Wabash* were remarkably exempt from bowel complaints and miasmatic fevers. This exemption we ascribed to the men drinking exclusively the pure rain-water collected in the vast boiler-iron cisterns of the United States Steam Navigation Company, which are filled from the roofs of their buildings, and hold many thousand gallons. The people of Aspinwall also use rain-water altogether, as they have no wells, springs, or streams convenient. That our crew's exemption from diarrhoea and dysentery was owing to this water, is proved by the case of an English ship of the line, which, I understand, had many cases, after using the water of the river *Mindi*—a small stream emptying into the south side of Navy Bay; and some cases of diarrhoea occurring in our crew, from the rain-water being sometimes made saltish by its being brought in open boats, which had taken in some sea-water, whilst being conveyed from shore during heavy swells. Our comparative exemption from fever was owing mainly to the *Wabash* keeping at a distance from shore, to being thoroughly cleansed, and having her crew as little as possible exposed to the sun and malaria. Few of the men were permitted to land. But many suffered from boils, lichen tropicus, and various herpetic eruptions; some from rheumatism and neuralgia. During the last of August, 1857, about one-half were affected with influenza, which first attacked the crews of our ships of war at Panama, next the people of that town and Aspinwall, and was last heard of at the island of St. Thomas, 800 miles to the eastward. Besides the above, we scarcely had any diseases of the respiratory organs to treat—not a case of phthisis occurred in many months; but one of pneumonia, attending an attack of remittent fever with hepatitis, proved fatal last October. A man on board the *Saratoga* likewise died of pneumonia at Greytown, 300 miles north of Aspinwall.

The cutaneous affections were very numerous and troublesome to cure. Wounds and ulcers were indolent, and so irritable that the metallie lotions, as of sulph. of zinc, nitrate of silver, and acetate of lead, appeared poisonous, especially when applied to the privates; wounds and ulcers, moreover, often bled profusely; and in the treatment of the numerous cases among the passengers from Gen. Walker's army, brought to the United States, no dressings would retain the blood. This was dark, thin, and plainly venous. For the cure of ordinary prickly heat, the application of diluted aqua ammoniæ was successful; but when it became scabby and formed the regular lichen tropicus, the warm-bath, citrine ointment, and a solution of five or ten grains of argent. nitras were commonly used efficaciously; sometimes the flowers of sulphur or other laxatives were given. In the cure of ulcers I conjoined local and general remedies, and in that of boils I at first applied poultices of powdered linseed; but they often increased the size of the boils, were inconvenient to make, and consumed a large amount of muslin. I substituted, with advantage, the pure nitrate of silver, before or after

¹ See the *Army Medical Statistics*, lately published.

lancing. In the treatment of miasmatic fevers, I used saline purgatives, mercurials, the acetates of potash and ammonia, acidulous drinks, hot and cold water bathing, and the sulph. of quinine largely, in solution with the elixir of vitriol and white sugar. The complicated case above mentioned was the only one which terminated fatally. Although the yellow fever was at Havana twice, while our ship was in the harbour not a case of it occurred in her; I saw many, however, in the mercantile and great military hospitals in its vicinity, which had been brought there from the vessels and the different posts about the city. The former hospital is on the eastern part of the harbour; and near the suburb of Reglus is a private establishment, rented and kept by the two Drs. Belot. The latter hospital consists of two distinct buildings, some distance apart; but only one of them was occupied when I was there. The cases of yellow fever seen were principally convalescent, and two had been attended with black vomit. One was that of a native boy, the other that of an Englishman, and one American had died of the fever the day before. Two dollars a day were charged for each patient, and twenty dollars for every one buried. 1331 cases were treated last year, of which from 20 to 22 per cent. ended fatally; but in November, 44 out of 202 died. One of the Drs. Belot stated to me that the yellow fever was infectious, atmospheric, and epidemic, but not contagious like smallpox; that it was always worse in the harbour among the shipping; he pointed out a vessel in which a number of cases had happened, two of which were fatal; but at the same time showed me an American ship, which had been in port for two months and a half, without having had a case on board.

The worst cases I saw were in the military hospital, which stands on the western side of the harbour, near the beach, between it and the new part of Havana. This hospital was built in 1842, is of marble from the Isle of Pines, about 300 feet wide and 600 long, two stories high, forms two large courts, filled with flowers, trees, and plants, and in its arrangements, conveniences, and attendance, was not excelled by any other hospital I have seen in any part of the world. The wards were well planned, all opened into the galleries encircling the courts; contained 800 patients, attended by twenty physicians, a half of whom were residents, and nursed chiefly by twenty-three sisters of charity. The wardrobe, dispensary, laboratory, and kitchen were spacious and well furnished. The cooking was done in fine iron ranges, burning coal. Infected clothes were purified by fumigation from a furnace in a room appropriated for that purpose. Another one is converted into a chapel; a third one contains a library, mostly of French works, and some handsome anatomical preparations. Convalescents eat in a back portico, overlooking the harbour. The food is neatly cooked, and principally consists of rice, bread, soup, beef, and chicken.

Sick and wounded seamen are in separate wards, and not mingled with the soldiers. All patients lie on iron bedsteads, with linen sacking bottoms, save a few on cots. Every bedstead is supplied with two sheets, one blanket, and a pillow. Between every two beds was a close stool, behind a curtain, hanging from a semicircular rod of iron, fixed at its ends into the wall. Last year, during the prevalence of the yellow fever, the hospital contained 1200 patients per day, of which number 250 were of the above fever. It was then necessary to use the verandas as wards, and they were so wide as to hold the beds crosswise, and yet to allow persons to pass between them and the courts. In a ward containing fifty-five beds, I saw a number of cases of yellow fever indiscriminately mixed with those of other complaints, and was assured by the resident physician who attended the

ward that the fever was non-contagious, and very rarely infectious in the hospital. The cases were in the primary, middle, and last stages. In the first stage there was headache, injected eyes, hot skin, frequent pulse; tongue moist, and covered with a thick, white fur, and red about the edges. Those in the middle stage were more severely affected, and more jammed; but in none did I find the pulse very full and strong. One patient pointed to a tub of water, and said he had just thrown up blood. Two other soldiers, in the last stage, were most distressing objects. Their eyes and skin were of a saffron hue; their faces haggard and stupid; their mouths expanded; their tongues dry, brown, and hard; one of them had lice enough; blood stained their lips; the pulse was small, weak, frequent; the skin cold and dry. The bed of one was deeply stained with dark blood, and this was sputtered also on the floor at the side of his bed, and that of another young, dying Spaniard. No painter could find two more horrible pictures of death to copy.

Treatment.—There was some difference in this at the private and public hospital. In the former, the first medicine given was the sulphate of magnesia, in doses large enough to purge, for several days. They were aided by cathartic enemata; cups and blisters were applied over the epigastrium, when nausea and pain in the stomach occurred. Cups were also applied to the nape of the neck for pain in the forehead, a striking symptom; blisters were sometimes placed upon the legs, and, when black vomit supervened, Dr. Belot gave small doses of astringents—ratanhia, alum, and acetate of lead, with some opium. His patients were given for drink and nourishment, chicken-broth, rice, and farina.

In the military hospital the primary treatment was likewise purging, with the sulphate of magnesia; but it was given in the dose of ʒj with gr. j of tart. emetic, and then followed by the administration of other internal remedies, chiefly astringents, of which the principal was the tinctura ferri chloridi, given agreeably to circumstances. Of the comparative success of the treatment at the two hospitals I was not informed accurately, but understood it was about the same.

The practice on board American vessels, of giving calomel, jalap, and then castor oil, the above physicians condemned as injurious. Several hundred of their seamen died last year. One was deprived of her whole crew, and part of two others, in a fortnight, according to the statement of our consul; and yet the practice does not seem worse than that in the Spanish men-of-war at Havana, which, the admiral of the port informed me, "lost at the above time 900 seamen out of 4,000, of the vomito," as the fever is there termed commonly, a mere symptom and effect being taken for the disease itself. Dr. Belot and other intelligent physicians regard the vomit as a mere mixture of blood, bile, and gastric juice. But although he thinks the fever non-contagious, there are many proofs to the contrary advanced by other eminent physicians; and we might concede, at least, that sometimes typhus fever might be conjoined with it, as it is believed it was at Pensacola and Warrington, in 1853, and caused it to spread from ship to shore, and then to spread from person to person at Fort Barancas and the Naval Hospital, among patients already there with other complaints, and likewise among the attendants.